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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,418	09/26/2003	Kazushige Ohno	82302Y	1355

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EXAMINER

GREENE, JASON M

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,418

Applicant(s)

OHNO ET AL.

Examiner

Jason M. Greene

Art Unit

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2004 and 24 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-33, 35-53 and 55-70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28-33, 35-49 and 70 is/are allowed.
- 6) ☒ Claim(s) 50-53 and 55-69 is/are rejected.
- 7) ☒ Claim(s) 52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/856,751.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

Drawings

1. In order to avoid abandonment, the drawing informalities noted in the paper mailed on 03 February 2004, must now be corrected. Correction can only be effected in the manner set forth in the above noted paper. The Examiner notes that correcting the drawings as proposed in the amendment filed on 12 July 2004 would be acceptable.

Response to Arguments

2. Applicant's arguments, see page 2, line 47 to page 3, line 34, filed 24 September 2004, with respect to claims 28-33 and 35-49 have been fully considered and are persuasive. The 35 USC 102 and 103 rejections of claims 28-33 and 35-49 have been withdrawn.

Specifically, the Examiner agrees with Applicants' arguments that the prior art made of record does not teach or fairly suggest the ceramic filters of claims 28, 38 or 45 wherein the filters are formed from alpha silicon carbide.

3. Applicant's arguments, see page 3, line 36 to page 5, line 30, filed 24 September 2004, with respect to the rejection(s) of claim(s) claims 50(as amended)-53, 55-57 and 58(as amended)-69 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Japanese Published Patent Application 6-182228.

4. Applicant's arguments, see page 5, line 32 to page 6, line 12, filed 24 September 2004, with respect to original claim 34 (rewritten as new independent claim 70) have been fully considered and are persuasive. Accordingly, new claim 70 is not taught or fairly suggested by the prior art made of record.

Claims

5. The Examiner suggests Applicants' insert a period at the end of claim 36 to correct a minor grammatical informality.

Claim Objections

6. Claim 52 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

dependent form, or rewrite the claim(s) in independent form. Claim 52 recites the sintered porous body of claim 50 being formed from silicon carbide, silicon nitride, sialon, alumina, cordierite, or mullite. However, since claim 50, from which claim 52 depends, has been amended so as to be limited to silicon carbide, claim 52 fails to further limit the subject matter of claim 50.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
8. Claims 50-53 and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 816 065 A1 in view of JP 6-182228.

With regard to claims 50, 52, 55 and 57, EP 0 816 065 A1 discloses an exhaust gas purification apparatus including a honeycomb filter formed from a sintered silicon carbide ceramic body and arranged in a casing that is located in an exhaust gas passage of an internal combustion engine to eliminate particulates included in exhaust gas, wherein the average pore diameter of the honeycomb filter is 10 μm and the average porosity is 43 percent in Figs. 1-5, page 5, lines 48-49, and page 6, lines 6-8.

EP 0 816 065 A1 does not disclose the silicon carbide having impurities of less than 5 weight percent or the honeycomb filter having 20 percent or more of through pores.

JP 6-182228 teaches forming a sintered ceramic honeycomb that can be used as a filter from silicon carbide having impurities (including the usual impurities such as Al, Fe, O, and free C) of 1.0 weight percent to provide a honeycomb having a large pore volume in paragraphs 0011 to 0018 of the English language translation. Since JP 6-182228 teaches using a low concentration of impurities to increase the pore volume of the honeycomb, the Examiner contends that the honeycomb will inherently have more than 20 percent through pores.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the silicon carbide having an impurity content of 1.0 weight percent into the filter of EP 0 816 065 A1 to provide a filter having high reinforcement and a large pore volume, as suggested by JP 6-182228 in paragraph 0018 of the English language translation.

With regard to claim 51, EP 0 816 065 A1 discloses the honeycomb filter comprising a plurality of cells including a first cell having a first end surface sealed by a sealing body and a second cell adjacent to the first cell, the second cell having a second end surface that is opposite to the first sealing body, the second end surface being sealed by a sealing body, wherein the thickness of a cell wall defining the cells is 0.3 mm in Figs. 1-5 and page 6, lines 5-8.

While EP 0 816 065 A1 does not explicitly disclose the cell number per square inch being 120 or more, one of ordinary skill in the art at the time the invention was made would have recognized that the honeycomb filter of EP 0 816 065 A1 inherently had a cell number of 120 or more. Since the honeycomb filter disclosed in EP 0 816 065 A1 and the honeycomb filter disclosed and claimed in the instant application have the same cell wall thickness and cell pitch (1.8 mm), the honeycomb filters will inherently possess the same number of cells per square inch.

Furthermore, since the cell pitch of the honeycomb filter of EP 0 816 065 A1 is disclosed, the number of cells per square inch can be determined. Since the cell pitch is the center-to-center distance between adjacent cells, the number of cells in a linear distance can be determined by dividing the linear distance by the cell pitch. For a length of 1 inch (25.4 mm) and a cell pitch of 1.8 mm, the result is 14.1 cells per linear inch. Squaring the result yields 199 cells per square inch. Therefore, the honeycomb filter of EP 0 816 065 A1 is seen as having a cell number of 199 cells per square inch.

With regard to claim 53, EP 0 816 065 A1 discloses each filter having a plurality of cells, and each cell having an outer surface which carries at least one oxide catalyst selected from a platinum group element, other metal elements, and oxides of these metal elements in Fig. 1 and page 6, lines 3-5.

With regard to claim 56, EP 0 816 065 A1 does not explicitly disclose the total volume of the honeycomb filter being one-fourth to two times the total displacement of the internal combustion engine.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the size of the honeycomb filter in that such is merely a choice of design. See *In re Rose*, 105 USPQ 237 and *In re Reven*, 156 USPQ 679.

9. Claims 58-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 816 065 A1 in view JP 6-182228.

With regard to claims 58 and 67-69, EP 0 816 065 A1 discloses a honeycomb filter for purifying a high temperature exhaust gas having a honeycomb filter having a plurality of cells defined by a cell wall and purifying fluid including particulates with the cell wall, wherein the cell wall purifies fluid including particulates, wherein the filter is located in an exhaust gas passageway of an internal combustion engine in Figs. 1-5 and page 3, line 36 to page 6, line 10.

EP 0 816 065 A1 does not explicitly disclose the specific surface area of the grains forming the cell wall being $0.1 \text{ m}^2/\text{g}$ or more, 0.1 to $1.0 \text{ m}^2/\text{g}$, or 0.3 to $0.8 \text{ m}^2/\text{g}$.

JP 6-182228 discloses a similar ceramic honeycomb that can be used as a filter wherein the specific surface area of the grains forming the cell wall is 0.1 - $5 \text{ m}^2/\text{g}$ and more specifically $0.7 \text{ m}^2/\text{g}$ in paragraphs 0011 to 0018 of the English language translation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the specific surface area of the grains of JP 6-182228 into the honeycomb filters of EP 0816 065 A1 to provide filters having high reinforcement and large pore volume, as suggested by JP 6-182228 in paragraph 0018 of the English language translation.

With regard to claims 59 and 60, EP 0 816 065 A1 discloses the filter being formed from a sintered porous silicon carbide body in page 6, lines 14-21.

With regard to claim 61, EP 0 816 065 A1 discloses each filter having a plurality of cells, and each cell having an outer surface which carries at least one oxide catalyst selected from a platinum group element, other metal elements, and oxides of these metal elements in Fig. 1 and page 6, lines 3-5.

With regard to claims 62 and 63, EP 0 816 065 teaches the average pore diameter of the filter being 10 μm and the average porosity of the filter being 43 percent in page 5, lines 48-49, and page 6, lines 6-8.

With regard to claims 64 and 65, EP 0 816 065 A1 discloses the thickness of the cell wall being 0.3 mm in Figs. 1-5 and page 6, lines 5-8.

While EP 0 816 065 A1 does not explicitly disclose the cell number per square inch being 120 or more, one of ordinary skill in the art at the time the invention was

made would have recognized that the honeycomb filter of EP 0 816 065 A1 inherently had a cell number of 120 or more. Since the honeycomb filter disclosed in EP 0 816 065 A1 and the honeycomb filter disclosed and claimed in the instant application have the same cell wall thickness and cell pitch (1.8 mm), the honeycomb filters will inherently possess the same number of cells per square inch.

Furthermore, since the cell pitch of the honeycomb filter of EP 0 816 065 A1 is disclosed, the number of cells per square inch can be determined. Since the cell pitch is the center-to-center distance between adjacent cells, the number of cells in a linear distance can be determined by dividing the linear distance by the cell pitch. For a length of 1 inch (25.4 mm) and a cell pitch of 1.8 mm, the result is 14.1 cells per linear inch. Squaring the result yields 199 cells per square inch. Therefore, the honeycomb filter of EP 0 816 065 A1 is seen as having a cell number of 199 cells per square inch.

With regard to claim 66, EP 0 816 065 A1 and JP 6-182228 do not explicitly disclose the honeycomb filter having 20 percent or more of through pores. However, since JP 6-182228 teaches using small grain silicon carbide grains to increase the pore volume of the honeycomb, the Examiner contends that the honeycomb will inherently have more than 20 percent through pores.


Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (9:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Greene
Examiner
Art Unit 1724


12/13/04

jmg
December 13, 2004